Department of Energy
Washington, DC 20585

WM DOCKET CONTROL CENTER

JUL 24 1987

'87 JUL 28 P3:43

Robert E. Browning, Director
Division of High-Level Waste Management
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Browning:

The purpose of this letter is to confirm the design basis accident dose limit meeting to be held at 9:00 am on August 26, 1987. The meeting will be held in Room 6E-069, DOE's Forrestal Building, 1000 Independence Avenue, S.W., Washington, D.C. The agenda for the meeting is attached.

I would like to clear up any confusion that may have resulted from my March 3, 1987 letter to Mr. Linehan, a copy of which is enclosed. I stated in the last sentence of that letter that we also discuss the forthcoming revisions to 10 CFR Part 20. The intent of this statement was to suggest that, because of the possible relevance of 10 CFR Part 20 to the accident dose limit, it may be appropriate for NRC staff familiar with Part 20 to attend the meeting. The scope of the meeting will be limited to our proposed change to 10 CFR Part 60 related to the design basis accident dose limit, as described in my enclosed letter to Mr. Linehan.

If you have any questions, please contact me at 586-9300 or Ed Regnier at 586-4959. We look forward to seeing you at the meeting.

Sincerely,

James P. Knight, Director
Siting, Licensing & Quality
Assurance Division, Office of
Civilian Radioactive Waste
Management

Enclosures

WM Record File 109.1
WM Project 1
Docket No.
PDR ✓
LPDR

8712100062 870724
PDR WASTE
WM-1 PDR

Distribution:
REB MJB
JOB
Linehan
Ballard
(Return to WM, 623-SS)

88123031
WM Project: WM-1
PDR w/encl
(Return to WM, 623-SS)

WM Record File: 109.1
LPDR w/encl

AGENDA FOR THE DOE/NRC MEETING ON DESIGN BASIS ACCIDENT DOSE LIMIT FOR THE PRE-CLOSURE PERIOD OF A REPOSITORY

U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Forrestal Building
1000 Independence Avenue
Washington, D.C.

OBJECTIVES OF THE MEETING

1. To provide the NRC with DOE's proposal for accident dose limit for the pre-closure period of a repository.

2. To solicit the views of the NRC regarding DOE's proposal.

3. To discuss follow-up actions needed to resolve any issues.

MEETING AGENDA

o Introduction.....DOE/NRC/States, Tribes (10-15 Min.)

- Introduction of participants
- Procedures to be followed
- Scope and objectives of the meeting
- Review of agenda
- Identification of representatives to prepare summary

o Background and DOE's position.....DOE (20-30 Min.)

o NRC's response to DOE's presentation.....NRC (15-30 Min.)

o Exchange and discussion.....ALL (30-60 Min.)

o Preparation and signing of summary meeting minutes

Department of Energy
Washington, DC 20585

MAR 03 1987

Mr. John J. Linehan, Acting Chief
Repository Projects Branch
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Linehan:

In our comments on the draft generic technical position on Items and Activities in the High-Level Geologic Repository Program subject to 10 CFR 60 Quality Assurance Requirements, July, 1986 we expressed our concern with the NRC's consideration of the 0.5 rem dose criterion for structures, systems and components important to safety as an accident dose limit, but deferred a detailed discussion of that subject for another time. The purpose of this letter is to provide you with our views on this matter.

We have also reviewed the letter dated March 7, 1986 from J. Linehan (NRC) to J. Knight (DOE) regarding preliminary NRC responses to DOE Q-List questions which discusses the basis for the NRC position on the accident dose limit. Our comments on that letter as well as our position on this subject are attached.

We agree with your assessment in the referenced letter that the subject of an accident dose limit for a repository is complex and will likely require additional interaction between our staffs. Because the subject of an accident dose limit is not specifically addressed in 10 CFR Part 60, we are considering the possibility of a petition for rulemaking on this subject. We would like to meet with you in the very near future to further discuss this issue. Because of the relevance of 10 CFR Part 20 to the subject dose limit, we would also anticipate discussing the forthcoming revisions to 10 CFR Part 20 at this meeting.

Sincerely,

James P. Knight, Director
Siting, Licensing & Quality
Assurance Division, Office of
Civilian Radioactive Waste Management

~~8703230028~~ 4pp.

DOE Views on Radiological Dose Criterion for Accidents at the Geologic Repository Operations Area of a Nuclear Waste Repository

Concerns with the Staff's Position

In its responses to DOE Q-List questions 1.2 and 1.3, the NRC staff has stated that 0.5 rem should be considered as the offsite dose limit for accidents at the geologic repository before permanent closure. The NRC has selected this value while conceding that its regulations are silent as to accident dose criteria. The staff's position is based on its reading of two sections of 10 CFR 60.

The first section, 10 CFR 60.111(a) states that "the geologic repository operations area shall be designed so that until permanent closure has been completed, radiation exposures and radiation levels, and releases of radioactive materials to the unrestricted area, will at all times be maintained within the limits specified in 10 CFR 20 and such generally applicable environmental standards for radioactivity as may have been established by the Environmental Protection Agency." The second section, 10 CFR 60.2, establishes 0.5 rem as the threshold value for determining what system, structures and components are "important to safety."

Reliance on 10 CFR 60.111(a) as the basis for an accident dose limit appears to be based on an interpretation of the phrase "at all times" as meaning that the limits in 10 CFR 20 and 40 CFR 191 Subpart A can never be exceeded. We suggest that the extension of these regulations to cover accident situations would be unprecedented from a regulatory viewpoint and was not intended when 10 CFR 60 was promulgated.

The extension would be unprecedented because the application of 10 CFR 20 has always been limited to normal operation. As was stated by the NRC when final 10 CFR 72 was promulgated (45 FR 74696),

> "While the terminology used in 10 CFR Part 20, specifically 'restricted and unrestricted' areas, applies to all nuclear facilities, it is limited to radiation protection concerns associated with normal operations and the means used by the licensee to control the access to areas of potential radiation exposure."

The staff's interpretation would, in effect, require conformance with the dose limits in 10 CFR 20 under both normal and accident conditions, and would impose as an accident dose limit a dose value which, at non-fuel cycle facilities, is permitted by 10 CFR 20 to be approached under routine conditions. As discussed in the next section, the staff's position would also result in an accident dose limit different from that which has been established for similar activities conducted at other nuclear facilities licensed by the Commission.

Similarly, 40 CFR 191, Subpart A, should not be extended to include accidental exposures because it is a generally applicable environmental standard. Accidental releases of radioactivity from NRC licensed facilities have never been within the scope of the generally applicable environmental standards promulgated by the EPA.

Our view that the extension of the dose limits for normal operation to accident conditions was not intended by the phrase "at all times" is supported by the NRC's June 19, 1986 notice in the Federal Register (51 FR 22296) regarding a proposed rule change to 10 CFR 60. In this notice the NRC states that the words "at all times" were intended to emphasize the need to design the geologic operations area so that any waste retrieval found to be necessary in the future could be carried out in conformance with the radiation protection requirements of 10 CFR Part 20. In order to clarify the meaning of the phrase "at all times" the staff is proposing to revise the wording to read "will at all times, including the retrievability period of 60.111(b), be maintained within the limits specified in Part 20...." We read this to mean during the period of controlled activity associated with retrieval. This supports the view that "at all times" does not contemplate accident situations.

In relying upon section 60.2, the staff suggests that the 0.5 rem level is not only the criterion for defining the accident which may be prevented or mitigated by a system identified as important to safety but also is the level to which accident mitigation must be effective. We find no evidence to suggest that this expansion of the definition into a substantive accident dose limit was either intended or suggested by the regulatory text or statements of consideration, or subject to public comment when the rule was promulgated. In fact, two commenters noted the absence of an accident dose criterion in the proposed rule (NUREG-0804, comments 326, 327). The NRC's references to the important-to-safety discussion on changes in Section 60.2 do not resolve those comments. Therefore, we submit that Section 60.2 does not provide an adequate basis for assuming that a 0.5 rem accident dose limit was either articulated or intended when the rule was promulgated. In fact, such an assumption is inconsistent with the body of NRC regulations in effect for other fuel cycle facilities and activities, as discussed below.

DOE Position

DOE recommends that the dose limit for accidents at the geologic repository operations area of a nuclear waste repository be consistent with dose limits which have been established for similar activities and be in concert with federal guidance on limiting public exposure from nuclear accidents.

The operations which will be carried out at the geologic repository operations area will primarily involve storage and handling of spent nuclear fuel and solidified high-level reprocessing waste. As such, the operations will be similar to those at an Independent Spent Fuel Storage Installation (ISFSI) and to refueling operations at nuclear power reactors.

The accident dose limit for an ISFSI is specified in 10 CFR 72.68 which requires establishment of a "controlled area" around an ISFSI such that:

> "Any individual located on or beyond the nearest boundary of the controlled area shall not receive a dose greater than 5 rem to the whole body or any organ from any design basis accident." (10 CFR 72.68(b))

In supplementary information to the final 10 CFR Part 72 (45 FR 74693) the NRC has stated that "[t]he 5 rem cumulative exposure limit is derived from protective actions recommended by EPA for projected doses to populations for planning purposes". Therefore, extending the NRC rationale to the geologic repository, the 5 rem dose limit seems appropriate for design basis accidents at the operations area of a geologic repository.

The accident dose limit for refueling operations at nuclear power reactors is specified in Section 15.7.4 of the Standard Review Plan (NUREG-0800) to be well within the guideline values of 10 CFR Part 100, paragraph 11. This is further specified in Section 15.7.4 of the SRP to mean 25% of the 10 CFR Part 100 guideline values, i.e., 75 rem for the thyroid and 6 rem for the whole body. The same dose limits have been established for accidents caused by dropping heavy loads on fuel assemblies and/or safety related systems, components or equipment (see NUREG-0612- Control of Heavy Loads at Nuclear Power Plants). Thus, existing regulations for refueling operations at nuclear reactors suggest a dose limit of 6 rem to the whole body for the geologic repository.

Based on the above arguments, we recommend a 5 rem whole body dose limit for accidents which are considered in the design of a nuclear waste repository.

As indicated above, a dose limit of 5 rem to the whole body is consistent with EPA guidance on limiting public exposure from nuclear accidents. It is a factor of 5 lower than the value which is "used in the evaluation of reactor sites with respect to potential reactor accidents of exceedingly low probability of occurrence, and low risk of public exposure to radiation" (10 CFR 100.11(a)(1)). It is numerically equal to the annual dose limit for occupational exposure which has been recommended by international and national scientific and standard-setting organizations (International Commission on Radiological Protection, National Council on Radiation Protection and Measurements, Federal Radiation Council) and which is included in NRC's regulations (10 CFR 20). Thus, DOE's proposed accident dose limit for a nuclear waste repository is not only consistent with limits set for similar operations at other facilities licensed by the NRC but also does not present an unreasonable risk.